INCREASE OFFICE PRODUCTIVITY

THROUGH

AN EFFICIENT TYPING STATION

PRODUCT UTILIZATION SERVICE
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A professional service to management promoting higher production and lower costs in the office through better utilization of equipment, personnel and work methods.

PRODUCTS AND METHODS RESEARCH DEPT., REMINGTON RAND INC., NEW YORK

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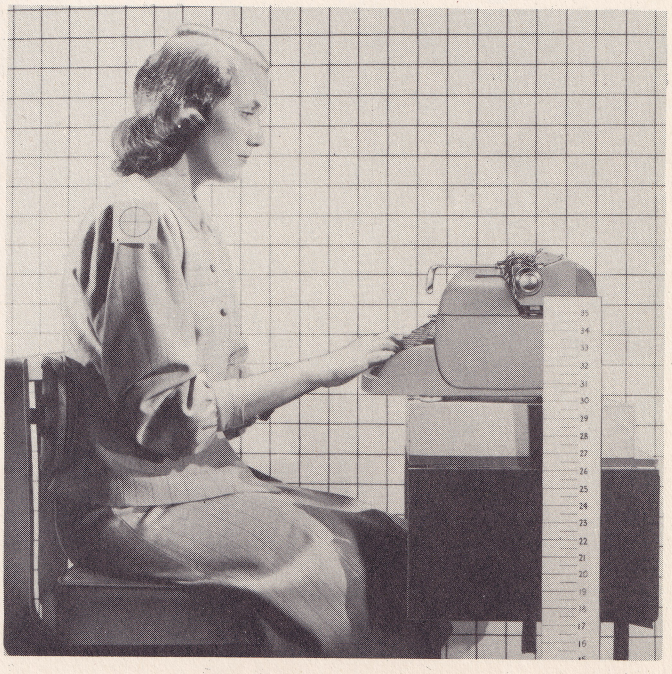
HOW HIGH SHOULD YOUR TYPEWRITERS BE PLACED?

Correct Typewriter Platform Height

How high should your typewriters be placed?...As high as necessary to permit and promote the fastest typewriting with the least effort. Research reports indicate that fast, accurate typewriting requires that the forearms and hands of the typist be approximately parallel to the slope of the typewriter keyboard. This slope on a manually-operated typewriter is about 30 .

For the average person the proper relationship between the angle of the forearms and hands and the angle of the keyboard slope is usually attained when the typewriter is resting on a surface between 28 and 30 inches from the floor and when the chair height is between 16 and 18 inches from the floor. This is corroborated by research studies conducted by business and government offices.

It should also be noted that prominent typewriting specialists have long advocated raising typewriter platform levels. Virtually all champion typists write with their typewriters about 30 inches from the floor.



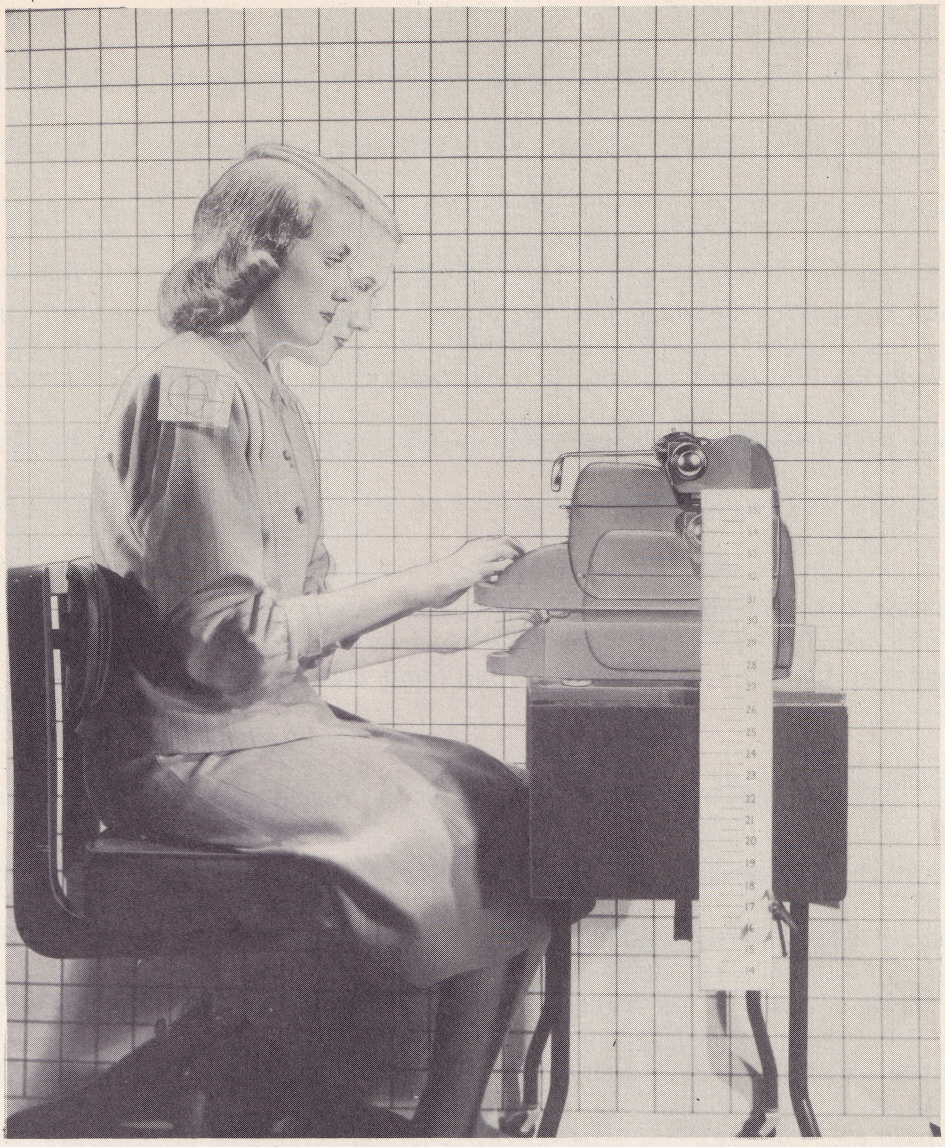


Fig. 3. Figure 1 is superimposed on figure 2 to facilitate the comparison of back, neck, and eye position; arm slope; and shoulder distance.

Results of Higher Platforms

Typewriting is not only faster, more accurate, and easier, but far less fatiguing when the typewriter has been raised to provide the correct angular relationship with respect to the forearms, the hands, and the keyboard.

It is faster because the typist's hands hug the keyboard and a speedy, "clawing" stroke, utilizing finger rather than arm movements, is encouraged. The keys are released more quickly and easily because the hand posture assists rather than resists the fingers.

It is more accurate because the hands are in close proximity to the keys. Greater control is obtained and the errors which result from flailing the hands and arms between strokes are avoided.

It is less fatiguing because the "clawing" finger motion is easier than the pounding, striking motion and greater leverage on the keys results from the shorter shoulder distance. In addition, higher typewriters promote good posture, balanced leg and foot support, and general relaxation.

It is easier because the distance between the eye and the platen is reduced, permitting the operator to see with ease what has been typed.

How to Get Proper Typewriter Height

Manufacturers, recognizing the scientific development described in this study, are building modern typewriter desks with an adjustable feature permitting adjustment of typewriter height from 28 to 31 inches. However, for experimental purposes, typewriters in offices equipped with non-adjustable desks can be easily and inexpensively raised to the higher, correct working level through the use of typewriter lift boxes.

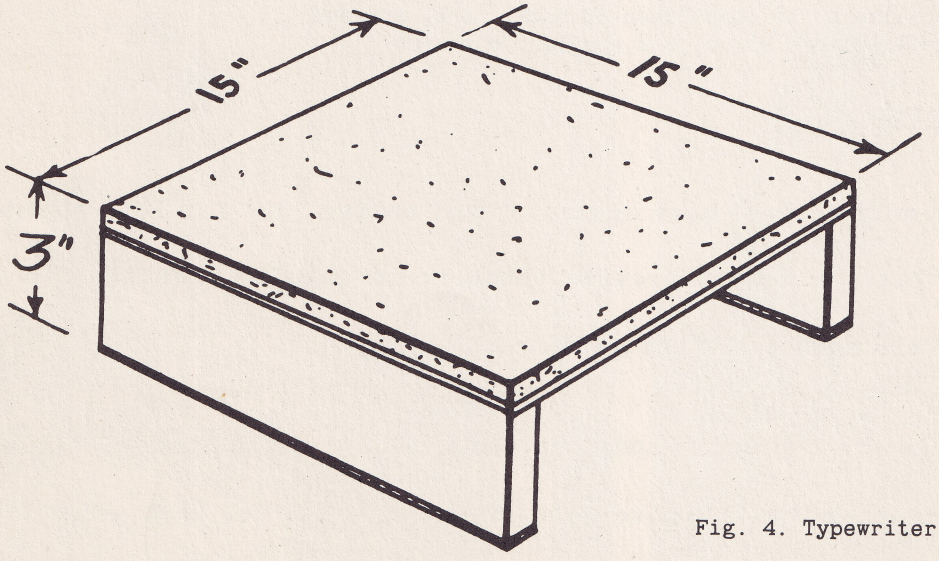


Fig. 4. Typewriter Lift Box.

Inexpensive lift boxes of run-of-the-mill lumber can be made easily by any carpenter. The 3-inch height shown is average. For special cases, 2-inch or 4-inch heights should be constructed. It is desirable that the top be made of a sound-deadening material and the bottom edges be covered with rubber strips to prevent sliding. By boring holes through the lift box, the typewriter can be fastened to the desk.

Thousands of typists have adopted the higher typewriter height. The results have been more than satisfactory to both the operators and the supervisors. The results show that the change has aided in reducing eye, neck, and back strain and has increased output considerably. Also type impressions on original copies have become more uniform and carbon copies are clearer.

In a recent bulletin, "A Study of Typewriter Height," The Society for the Advancement of Management summarized the research and experimentation conducted on this problem to date; and the organization has requested its members to test higher typewriter levels in their operations and report on their experiences.

Recommended Procedure for Changing to Higher Platforms

An experimental approach to this problem is recommended in the interest of increased production, reduced fatigue, and lowered typewriting costs. A sample installation can be made in your own organization. The following procedure has been found effective:

1. Hold a demonstration meeting with some of your typists. Explain the procedure to them and have a skillful typist demonstrate typewriting on a lift box.
2. Ask for volunteers to try out higher typewriters in their daily work.

3. Follow up the meeting by a desk-to-desk adjustment and installation program similar to the following:

   a. Adjust the typist's chair so that her feet rest firmly but comfortably on the floor. Chair height in most cases should be 16 to 18 inches from the floor. Adjust the back rest of the chair to fit the small of the typist's back at not higher than waist level. (See detail of posture chair adjustments, pages 9-10.)

   b. Raise the typewriter by means of a lift box (an inverted desk mail box may be used for experimental purposes) until the typist's forearms are almost parallel to the slope of the typewriter keyboard; i.e., at an angle of 30° with the horizontal. As has been stated, this angle is usually attained when the typewriter is resting on a surface between 28 and 30 inches from the floor, depending upon the physical makeup of the operator. A template cut to show a 30° angle will be a helpful guide in making this adjustment.

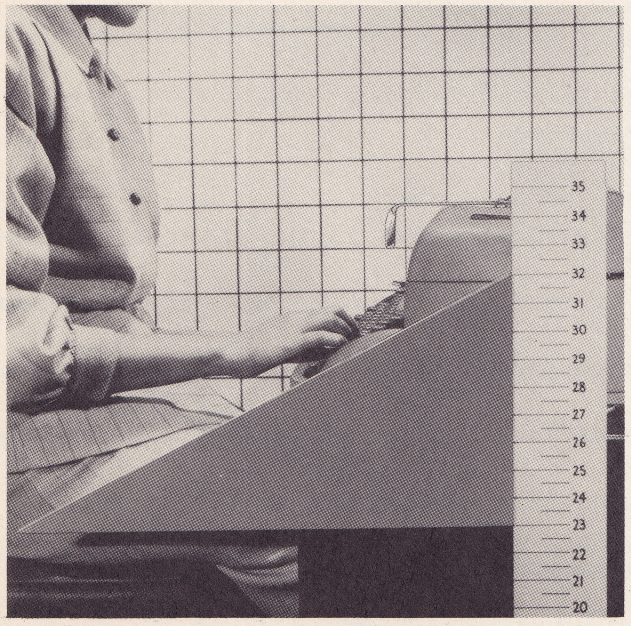


Fig. 5. Typewriter in low position. Typist's forearms horizontal.

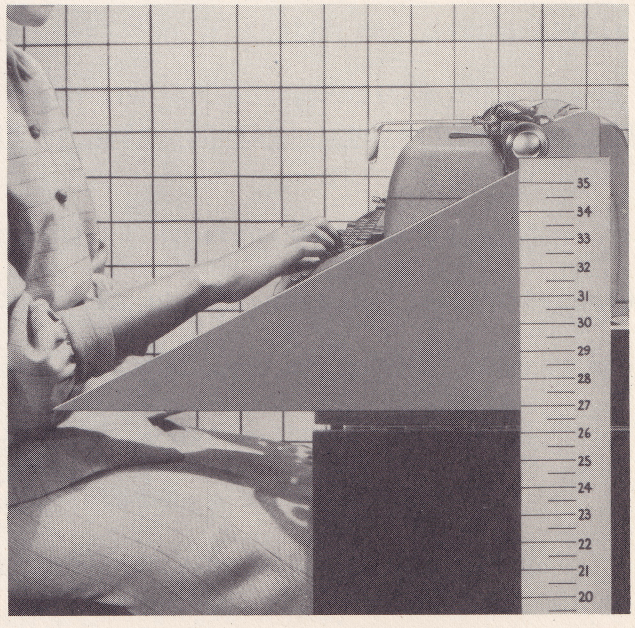


Fig. 6. Typewriter in high position. Typist's forearms parallel 30° keyboard slope.

c. Allow five days for the typist to become accustomed to the new height. Some typists will make the adaptation within 20 minutes.

4. Check with the typists frequently, daily if necessary, to determine their reaction to the higher typewriter levels. Make additional adjustments as needed.
5. If, after a fair trial, a typist is not sure that she likes the new height, remove the lift box and have her try the old height for purposes of comparison. In most cases, she will elect to keep the higher height.
6. Continue this program until as many typing stations as possible are properly adjusted.

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Results of One Research Study

You will be interested in the U. S. Department of Agriculture research statistics reproduced on the following page. Note that the "mean adjusted height of typewriter" is 30.67 inches.

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The Product Utilization Department

The Product Utilization Department, Remington Rand Inc., has studied this subject at considerable length. When the statistics are condensed and interpreted, the results are clear: higher typewriters mean less fatigue, fewer errors, greater fluency, and more production for typists.

Measurements of 9 USDA Typists Seated at Their Machines

	Height (inches)	Back strain (degrees)	Added neck strain (degrees)	Eye strain (degrees)	Arm slope—up position (degrees)	Arm slope—down position (degrees)	Adjusted height of typewriter (inches)	Shoulder distance—up position (inches)	Shoulder distance—down position (inches)	Eye distance—up position (inches)	Eye distance—down position (inches)	Upper arm length—shoulder to elbow (in.)	Forearm length—elbow to knuckle (inches)	Forearm length—elbow to wristbone (inches)	Torso length—shoulder to chair seat top (in.)
Gibbons	59	4.0	3.0	11.0	31.0	11.0	30.50	16.0	17.0	21.5	22.7	10.0	10.0	8.0	19.4
Ramsey	62	2.0	2.5	10.0	21.0	4.0	30.50	17.6	19.2	21.9	24.2	11.1	11.0	8.2	22.0
Johndreau	62	5.0	15.1	13.0	25.0	4.0	31.25	15.8	17.0	21.6	20.4	11.2	10.8	8.5	22.2
Gaynor	63	4.0	3.5	10.5	29.0	12.0	30.50	16.0	16.8	20.3	21.2	11.3	11.6	9.0	19.8
Graziano	64	1.0	6.0	11.0	28.0	6.0	31.00	15.0	17.0	20.7	22.4	11.2	11.0	8.4	21.5
Abigail	64	1.0	5.0	7.0	31.0	14.0	30.25	15.8	17.5	20.3	21.2	12.5	11.8	9.5	21.8
Riebow	65	0.5	4.0	10.0	30.0	14.0	31.00	15.5	17.8	21.9	24.0	11.7	11.2	8.7	21.4
Wingo	66	6.0	11.0	9.0	29.0	13.0	30.00	16.8	17.2	21.0	19.8	13.0	11.9	9.0	21.5
Nicolet	67	4.0	3.0	11.0	31.0	10.0	31.00	16.5	18.2	22.5	23.8	12.6	12.0	9.8	21.6
Mean	*63.6	3.1	5.9	10.3	28.3	9.8	30.67	16.1	17.5	21.3	22.2	11.6	11.3	8.8	21.2
Standard Error of Mean	0.8	0.7	1.4	0.5	1.1	1.4	0.14	0.3	0.3	0.3	00.5	0.3	0.2	0.2	0.3

Pair differences, average

Arm slope, up — down + 18.5° ± 0.8
Shoulder dist., down — up + 1.4″ ± 0.2
Eye dist., down — up + 0.9″ ± 0.4

* This mean compares very favorably with 63.16, the mean height of 10,042 women as reported in Miscellaneous Publication No. 454, "Women's Measurements for Garment and Pattern Construction," U. S. Department of Agriculture, 1941.

HOW SHOULD YOUR POSTURE CHAIRS BE ADJUSTED?

Fifty years ago, clerks worked at "stand-up" desks. Then it was found they could do more work sitting down so office chairs began to come into general use. Until recently, however, office chairs had not kept pace with the general scientific progress in office techniques. Individual comfort was ignored. The same chair was used for tall workers, short workers, and workers of average height.

Leffingwell and Robinson, in their TEXTBOOK OF OFFICE MANAGEMENT, state:

> "If the office manager will make a round of his office, paying particular attention to the postures of the clerks, he will note many signs of fatigue. If he especially notices the position of the feet he will find that many are entwined around the chair legs, and observing such clerks for a short period he will note that they twist about and change their positions constantly. He will find clerks humped over their work because either the chair or the desk is not the right height--perhaps both; clerks slumped down on their chairs, sitting on the base of their spines. All such positions are not due to carelessness or slovenliness as regards posture, but are a direct result of defective seating."

When it is considered that an office worker spends from 1,500 to 2,000 hours each year seated at a desk, it is not difficult to estimate the costly effect of uncomfortable and unscientific seating on employee morale and office production. Authorities on office

techniques today recognize the effect of proper seating on office productivity. Its importance is stressed by Leffingwell and Robinson as follows:

> "While the subject of correct seating has received little attention in the past, it is now being gradually recognized as a matter of the highest importance in its demonstrated effect on the quantity and quality of output."

Dr. Coleman Maze, in his book, OFFICE MANAGEMENT, recognizes the effect of good seating on office efficiency.

> "Chairs have come in for increasing study. The so-called posture chair has demonstrated its worth in giving body support and comfort to the office worker. Posture chairs have been designed for certain operations as posting and typing. They have made their contribution in increasing job output and reducing fatigue."

Modern typing chairs have built in them adjustments that encourage good sitting posture--that position in which the various parts of the body function most efficiently. Posture chairs ordinarily have controls to adjust: the height of the seat; the height, pressure and tilt of the posture back; the tilting action of the chair. The controls for making these adjustments are explained with the following illustration. It will pay dividends in comfort for the operator and increased output for the firm to have each posture chair so adjusted that it will conform to the physical makeup of its occupant.

(See page 12 for posture chair adjustments and illustration.)

POSTURE CHAIR AND ADJUSTMENTS

This posture chair is fully adjustable to the occupant's own comfort. Adjustments are made quickly and easily -- without tools -- by means of three hand wheel controls. These permit the occupant to regulate (1) height of seat, (2) height of back rest, and (3) backward-forward position of back rest.

The rigid back rest, comfortably curved-to-fit, provides the firm support needed for erect and restful posture during long hours of seated work. The foam rubber cushions will not sag or pack down but remain buoyant. This chair has arc-welded steel construction throughout.

HOW SHOULD YOUR READING COPY BE PLACED?

Those who have had the opportunity to visit different business offices know that there are in use today innumerable types of copyholders on which reading copy or shorthand notes are placed for typing. These range in reading comfort and efficiency from very good to very bad--unfortunately, mostly very bad. Some typists use no copyholder, placing copy flat on the desk, which also falls in the category of very bad. The advantages of proper posture chair and typewriter height adjustment can be fully maintained only by correct placement of reading copy.

To make for maximum visibility, reading comfort, and efficiency, reading copy should be placed so that:

1. Reading matter is perpendicular, or at right angles, to the line of sight. Studies have proven that when the angle of reading copy is increased from 90 to 135°, its visibility is reduced to 70%. Luckiesh and Moss, in their book, READING AS A VISUAL TASK, state:

   > "The inclination of the printed page with the line of sight is directly related to the visibility of the type. For example, assuming that the visibility of a given 10-point type is 100 when placed in a plane perpendicular to the line of sight...its visibility would be reduced to 70 percent when the printed page is inclined at an angle of 135 degrees with the line of sight."

2. It is directly in front of the typist. Reading copy from the side makes for continual head twisting and consequent aching neck muscles.

3. It is at a constant distance. Copy placed at an angle greater than 90° necessitates constant change of eye focus because reading distance will vary from line to line.

4. It does not cause light reflection or glare. Copy tilted toward overhead lights often reflects glare.

In general, it will be found that scientific, mechanical, copyholders which have been specifically designed to gain maximum reading efficiency, as well as operator comfort, do incorporate the above important specifications. In addition, the scientifically designed copyholder usually provides a line guide in which the line being copied is underscored, thus preventing skipping and other inaccuracies.

An evaluation of the copyholders now used at typing stations may furnish another means of increasing operator comfort, morale, and office productivity.

AN EFFICIENT TYPING STATION

Business today invests an average $2500 a year in the operation of a typing station, to cover typist's salary, equipment, supplies, rent, taxes, etc. Of this amount it has been estimated the desk, chair, copyholder, and typewriter--the all-important tools of the efficient typing station--represent only $50 annually. Therefore, it is important to provide the tools that make for the greatest efficiency, the greatest return on the typing station investment.

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